

# NASA: Airline Operations Workshop

## Airline Operations Center from a National Traffic Management Operations Supervisor Perspective

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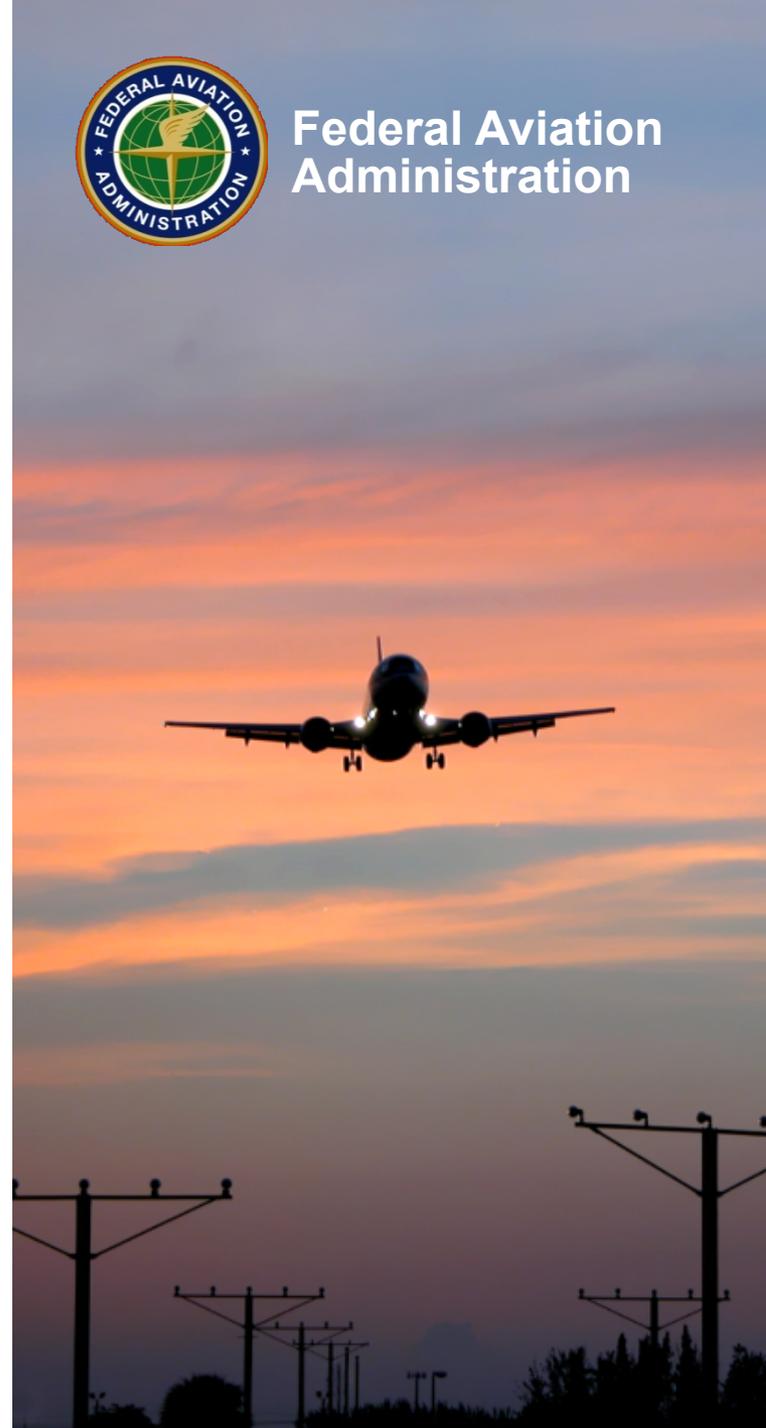
FAA Air Traffic Control System Command Center

National Traffic Management Officer (NTMO)

Date: August 2-4, 2016



Federal Aviation  
Administration



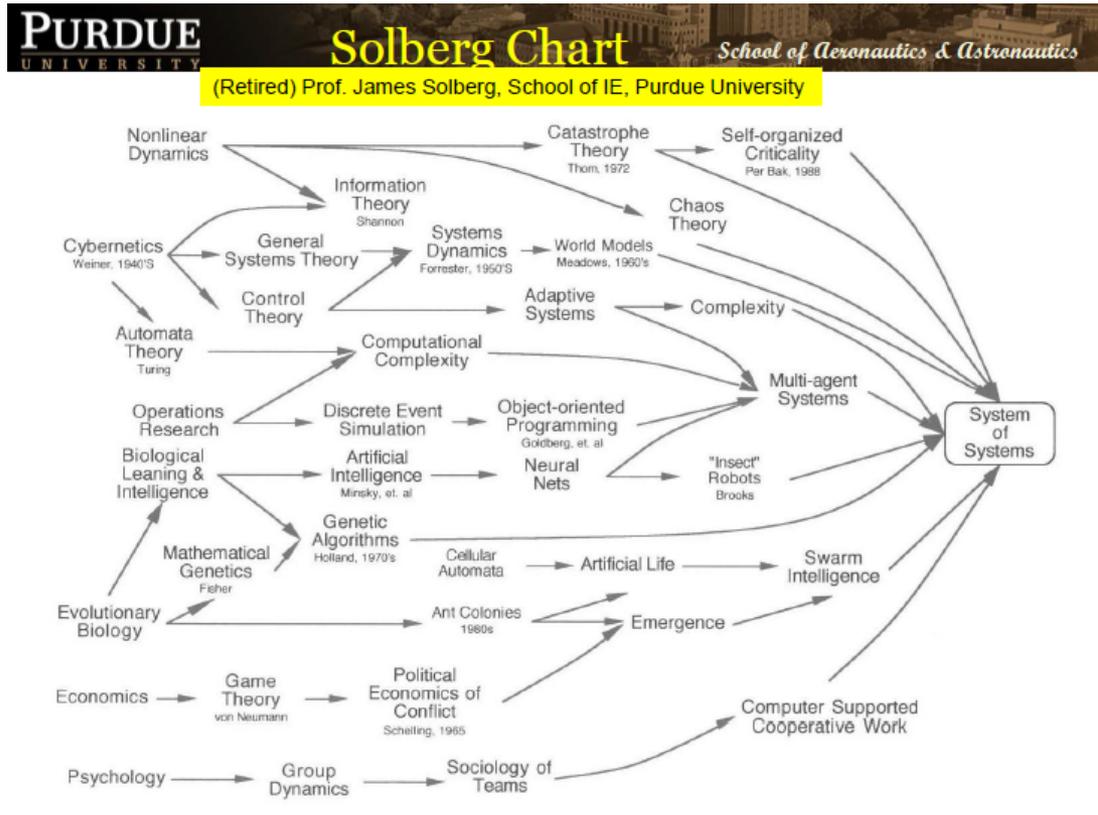
# Agenda

- **Disclaimer**
- **Discussion Assumptions**
- **Airline Operations**
- **ANSP Service Delivery**
- **Organizational Process Strategy**
- **Discussion and Continuance of Workshop**

# Disclaimer

- **The contents of this material reflect the views of the author and do not necessarily reflect the views of any specific plans or FAA program. The content is intended to foster discussion, dialogue, and sharing of innovative solutions to support more safe and efficient airline operations.**
- **The workshop developers at NASA want to emphasize exchanging information rather than promoting products.**

# Discussion Assumptions



# Discussion Assumptions

- **Operations Perspective / Uncertainty / Imperfect Information / CDM**
- **NAS ATM is a Complex Adaptive System (CAS)**
- **System-of-Systems Approach Needed to Scale From Current State to Range of Possible Futures That Meet Needs of ATS**
- **SoS Levels of Abstraction Must be Accounted For in Solutions**

# Discussion Assumptions

- **Scalability, Complexities, Known, Unknown, Unknowable**
  - SATS (NASA Small Aircraft Transportation System)
  - VLJs (Very Light Jets)
  - New Airline Entrants (i.e. Independence Air)
  - Designing DST's For an Uncertain Future (i.e. TBFM)
- **AOC Integration (Automation, Procedures, Humans) Increases Likelihood of Successful ANSP Delivery of Desired Services**
- **PBN Implementation and Benefits is/are a Challenging Priority**
- **Consideration of Big Data and Supercomputing Solutions Threaded Into Operations Service Delivery and Corporate Culture**

# Discussion Assumptions

- **Going Beyond Business as Usual.**

**Business as usual in the form of continued evolutionary improvements to existing technologies, aircraft, air traffic control systems, and operational concepts, is unlikely to meet the needs of air transportation that will emerge over the next 25 to 50 years.**

- **Securing The Future of U.S. Air Transportation: A System in Peril**  
(Committee on Aeronautics Research and Technology for Vision 2050; National Research Council 2003)

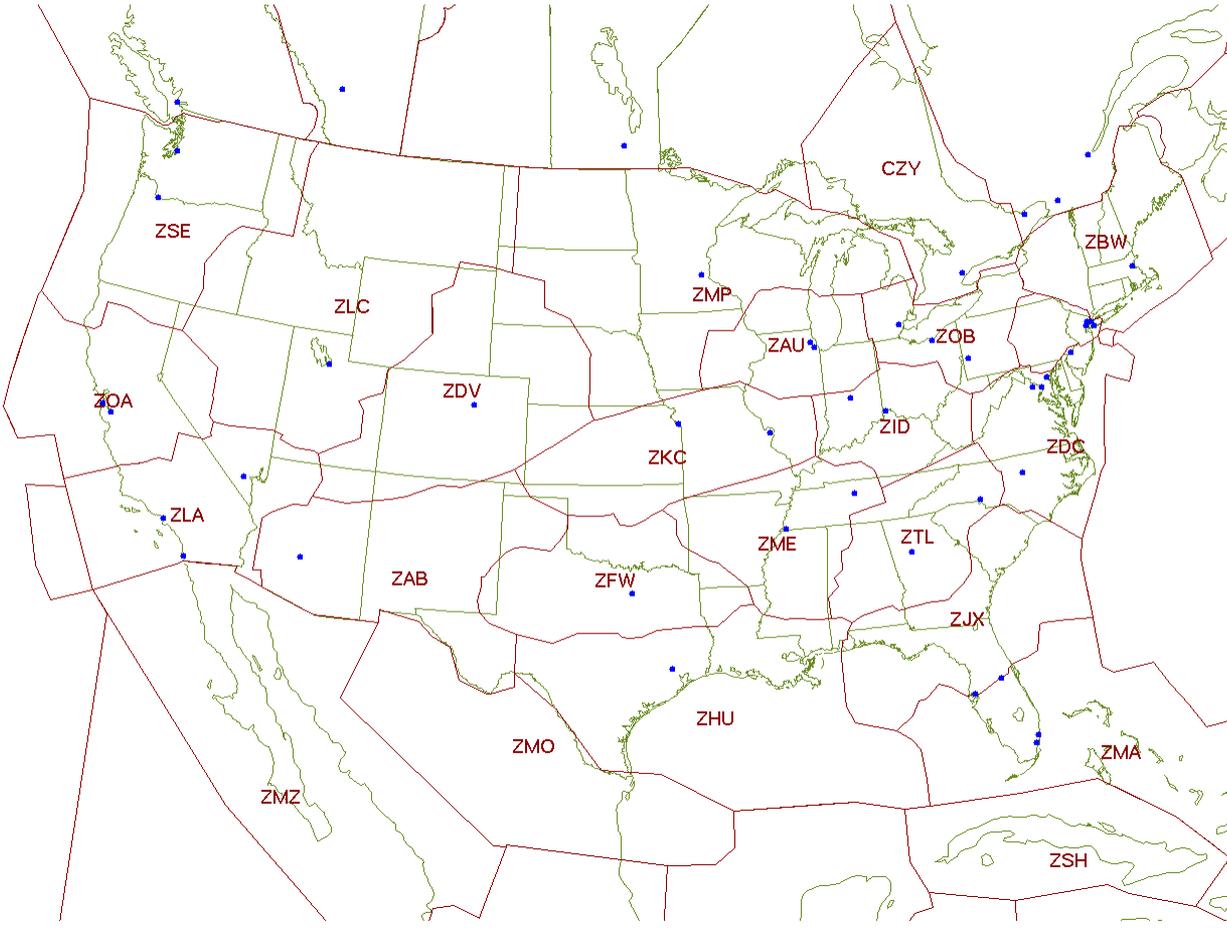
# Airline Operations



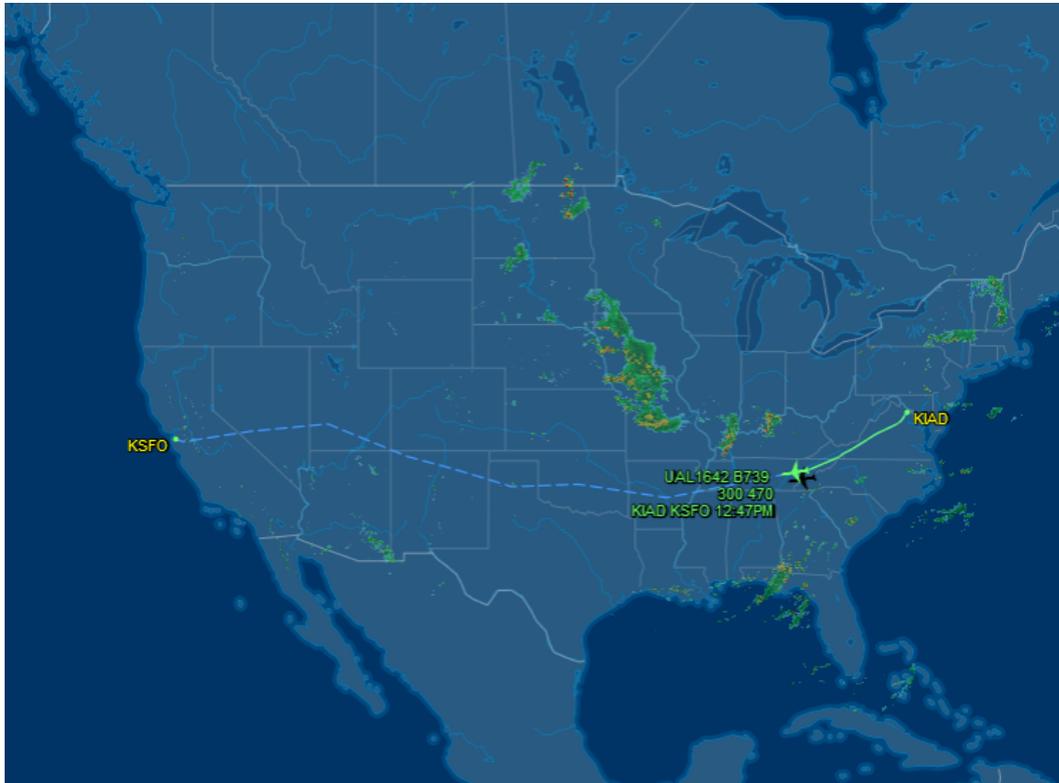
# Airline Operations



# Airline Operations



# Airline Operations



**United 1642**  
[\(Track inbound flight\)](#)  
 UAL1642 - "United" [\(all flights\)](#) [united.com](#)

Washington Dulles Intl ( <a href="#">KIAD</a> ) Gate C2	San Francisco Intl ( <a href="#">KSFO</a> ) Terminal 3, Gate 64
<b>10:37AM EDT</b> Scheduled: 09:40AM EDT 7-day average: 10:15AM EDT	<b>12:47PM PDT</b> Scheduled: 12:13PM PDT 7-day average: 12:21PM PDT

[Other flights between these airports](#)

54 min | 4 hr 15 min

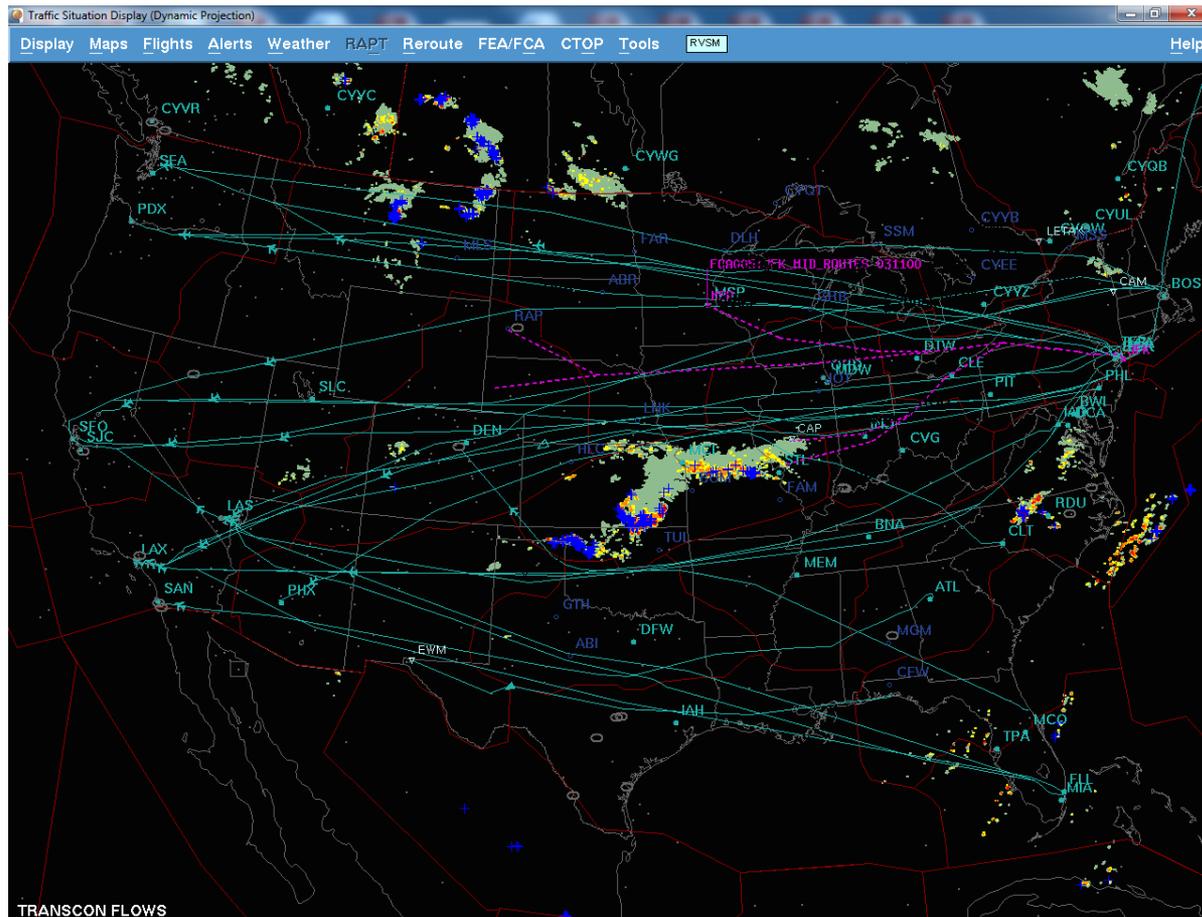
Duration: 5 hours 10 minutes

**Monday, August 1, 2016**

Status	<b>En Route</b> (438 sm down; 2,088 sm to go) <a href="#">(track log &amp; graph)</a>
Aircraft	Boeing 737-900 (twin-jet) ( <a href="#">B739</a> - <a href="#">photos</a> )
Speed	470 kts (planned: 460 kts) ( <a href="#">graph</a> )
Altitude	30,000 feet (planned: 30,000 feet) ( <a href="#">graph</a> )
Distance	Direct: 2,415 sm Planned: 2,616 sm
Fare	Average: \$328.91 ( <a href="#">airline insight</a> )
Cabin	First: Breakfast / Economy: Food for sale <a href="#">Amenities</a> - <a href="#">Seat Map</a> - <a href="#">Standby List</a> - <a href="#">Upgrade List</a>
Route	CLTCH1 MAULS Q40 ALEAN AMOJO HESIG MEM J66 GEEYY J66 LIT J6 PNH RSK J58 OAL INYOE DYAMD3 ( <a href="#">Decode</a> )

San Francisco Intl ([KSFO](#)) is currently experiencing inbound flights delayed at their origin an average of 1 hours 2 minutes due to low clouds.

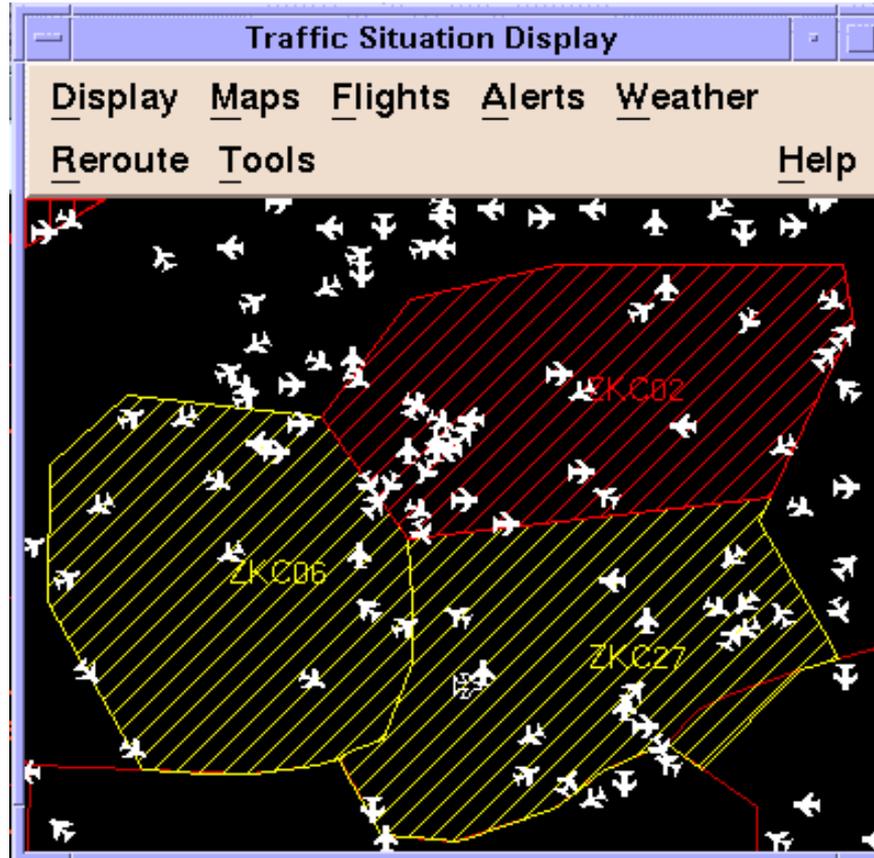
# Airline Operations / ANSP Service Delivery



# ANSP Service Delivery



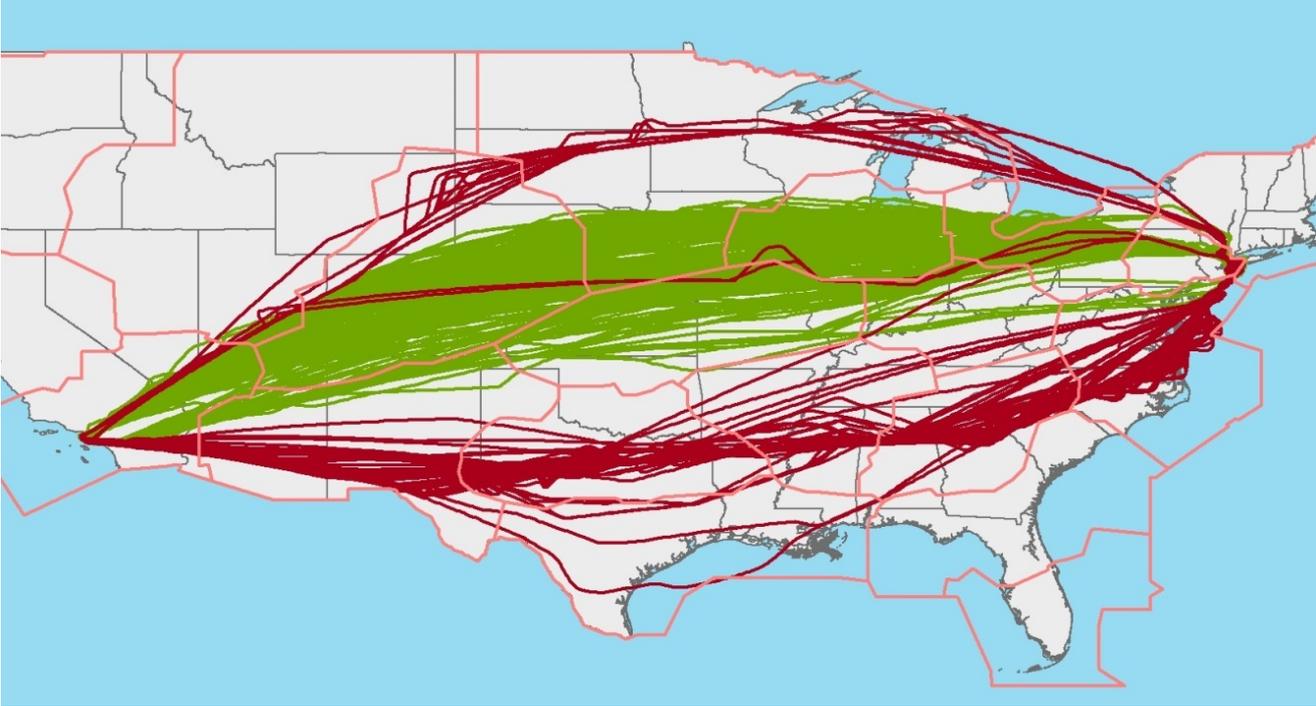
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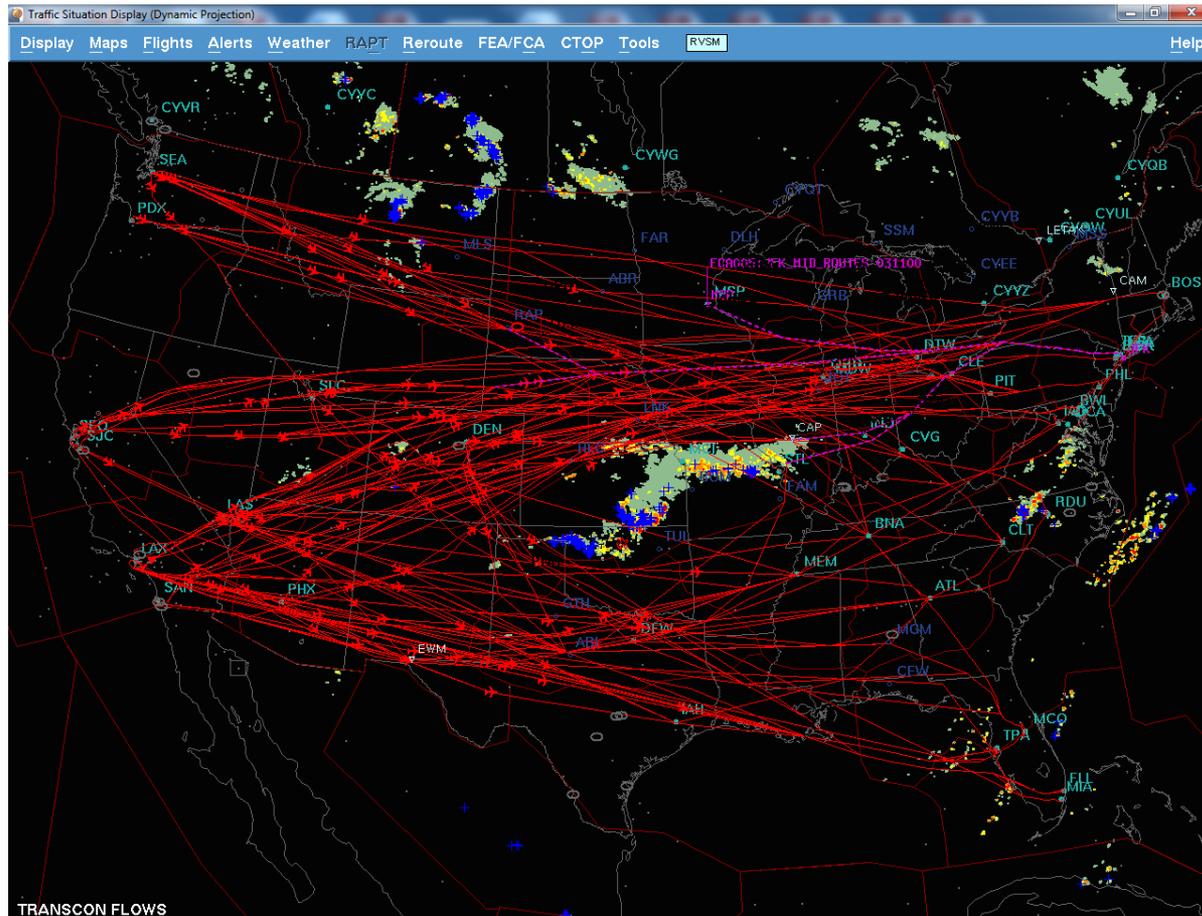
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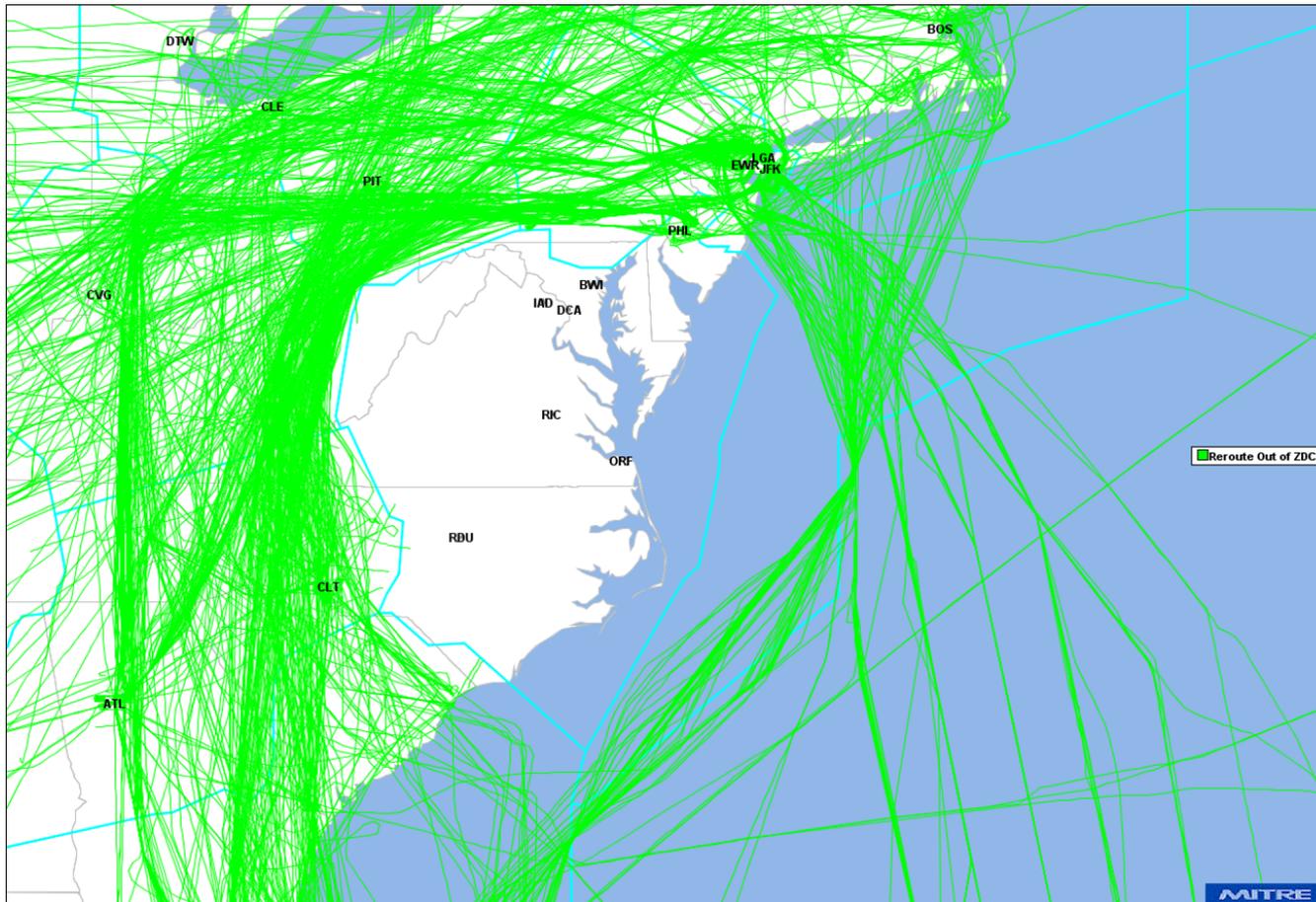
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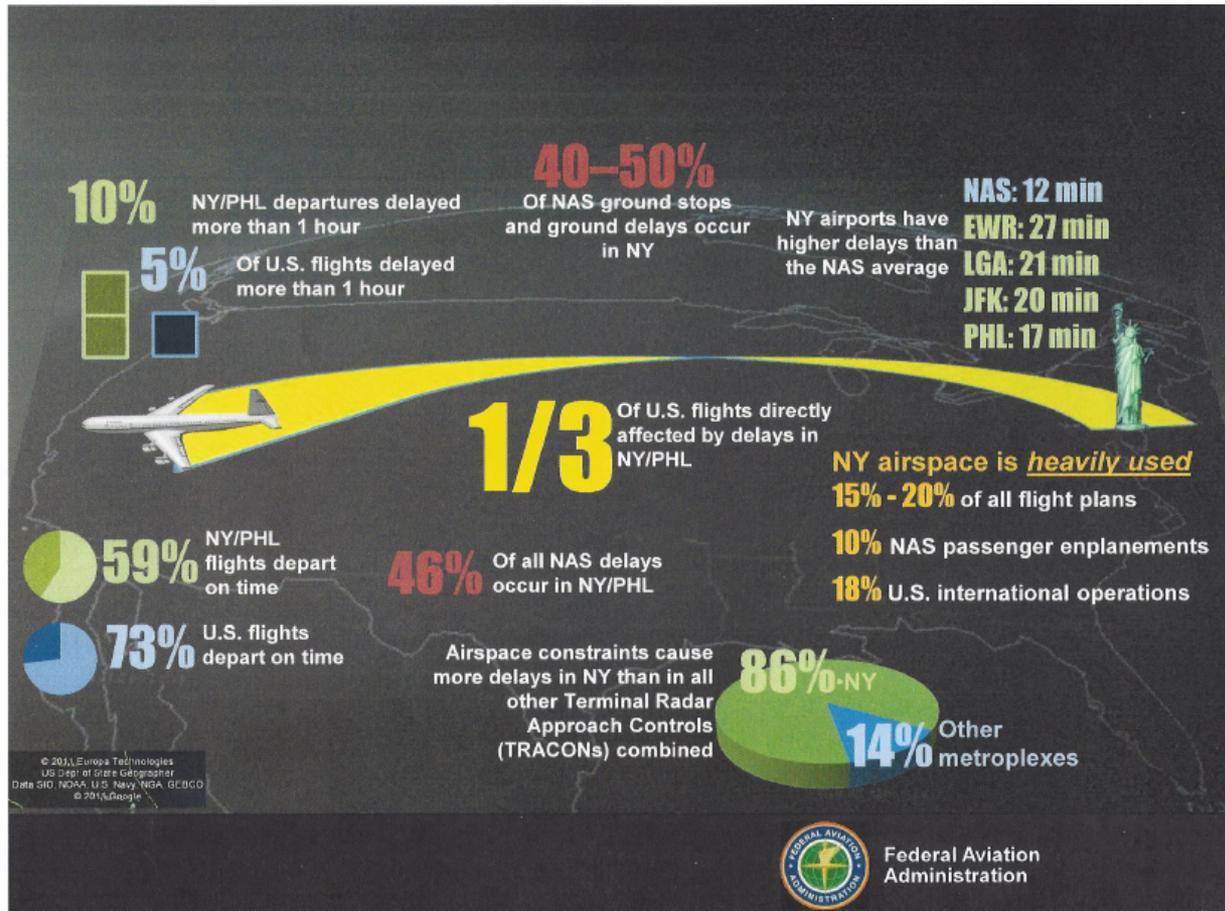
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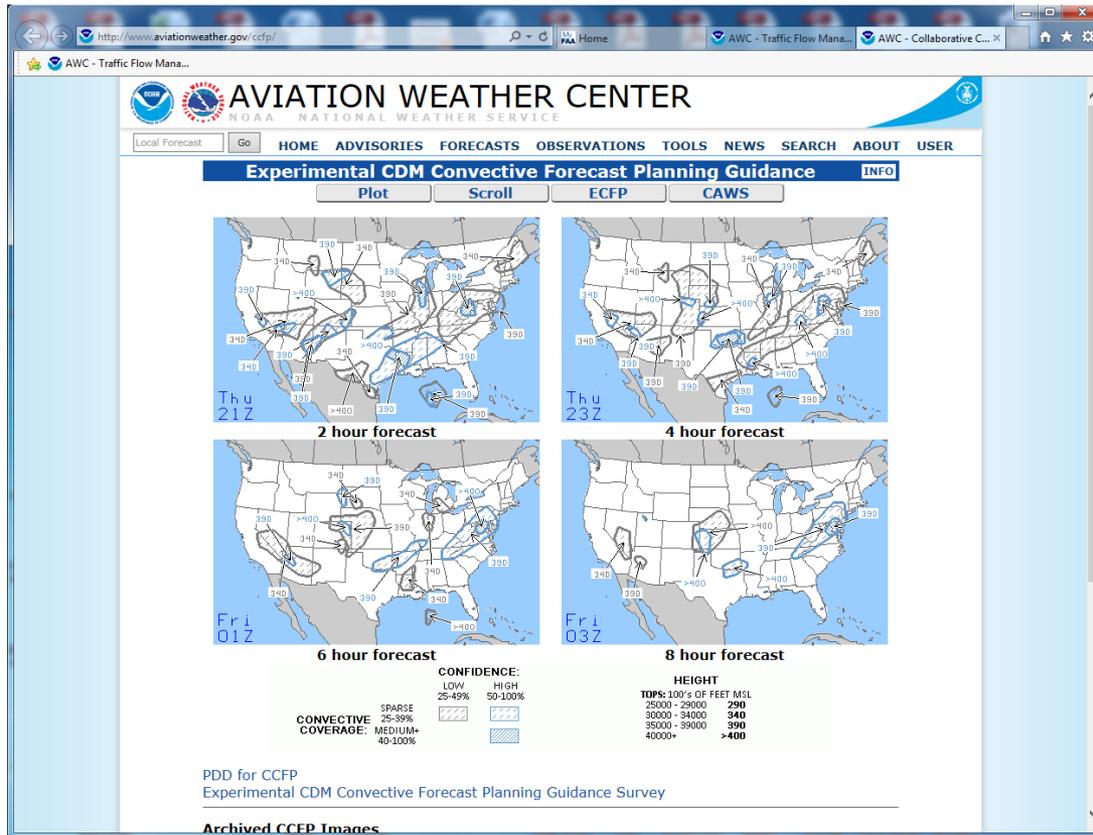
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www.fly.faa.gov/ois/

## NATIONAL AIRSPACE SYSTEM STATUS

(Note: This page will refresh every 5 minutes. Last updated Thu, 28 Jul 2016 20:22:49 UTC. Provided by the FAA's Air Traffic Control System Command Center.)



**ATCSCC  
OIS  
SYSTEM**

7/28/2016

OIS Main Menu

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NATIONAL PROGRAMS									
PROGRAM NAME	START	END	SCOPE	REASON	AVG	AAR	PR	ADVZY	DA
EWB	1600	0359	ALL+CZY	WEATHER / THUNDERSTORMS	144	24	24	180	DA
IAH	1834	2359	1000 NM	WEATHER / THUNDERSTORMS	129	32	32	145	DA
JFK	1600	0359	ALL+CZY	WEATHER / THUNDERSTORMS	188	28	28	178	DA
LGA	1600	0359	1425NM + CZY	WEATHER / THUNDERSTORMS	131	20	20	177	DA
ORD	2010	0359	ALL+CZY_AP	WEATHER / THUNDERSTORMS	135	32	32	184	DA
PHL	1600	0159	ALL + CZY	WEATHER / THUNDERSTORMS	65	60	60	081	DA
<a href="#">FCAB08</a>	1800	0259	See Control Element...	WEATHER / THUNDERSTORMS	53	--	100	090	DA
<a href="#">ECAOB2</a>	1900	0359	See Control Element...	WEATHER / THUNDERSTORMS	124	--	115	153	DA

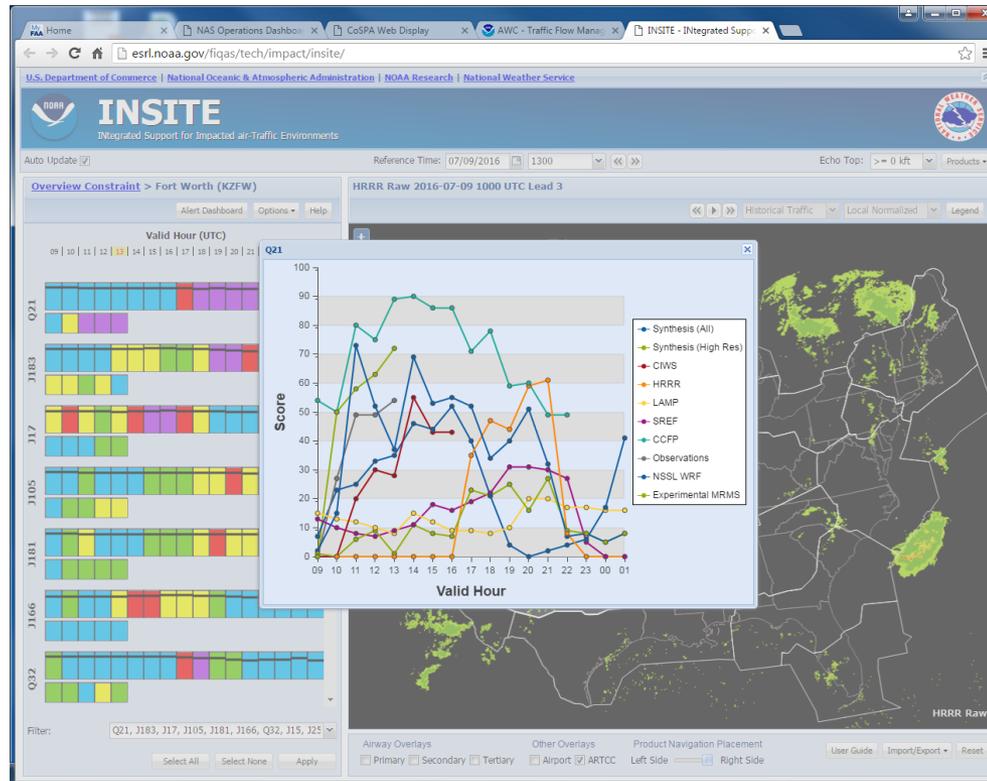
  

GROUND STOPS					
ARPT	UPDATE	POE	SCOPE	REASON	ADVZY
BWI	2030	MED	ZAU ZKC ZMP ZOB + CZY	WEATHER / THUNDERSTORMS	158
DCA	2100	MED	1ST TIER + CZY + ZMP ZAU ZOB ZKC	WEATHER / THUNDERSTORMS	174
IAD	2115	LOW	ZDC ZJX ZID ZTL ZNY	WEATHER / THUNDERSTORMS	183
MDW	2030	HIGH	2ndTier	WEATHER / THUNDERSTORMS	149
ORD	2115	MED	ALL+CZY_AP	WEATHER / THUNDERSTORMS	182

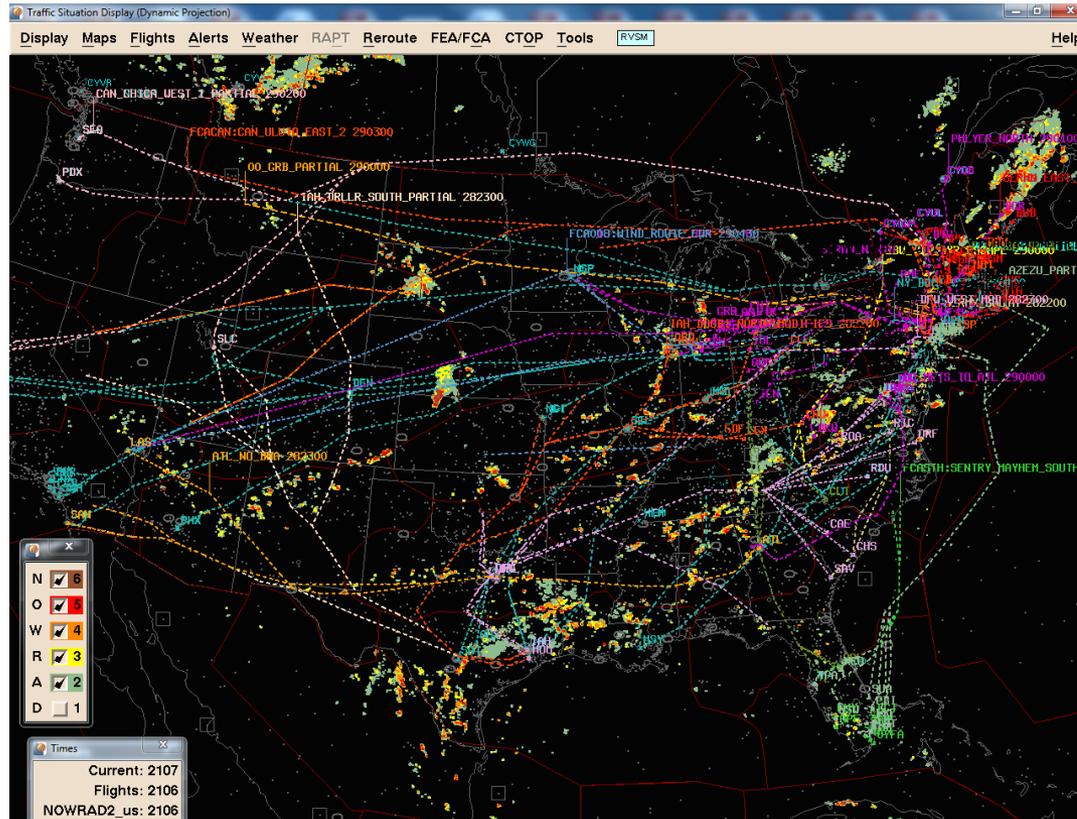
  

DELAY INFO				AIRPORT CLOSURES				
ARPT	AD	DD	TIME	REASON	ARPT	TIME	REASON	REOPEN
DCA		+105	1953	TM Initiatives-SWAP-WX				
EWB		-60	1932	TM Initiatives-SWAP-WX				
EWB	+45		1935	ZDC-WX Thunderstorms				
IAD		+75	1943	TM Initiatives-SWAP-WX				
JFK		+75	2009	TM Initiatives-SWAP-WX				
LGA	+45		1935	ZDC-WX Thunderstorms				
LGA		+60	2003	TM Initiatives-SWAP-WX				
ORD		+30	1942	TM Initiatives-MIT-WX				
PHL		+90	1950	TM Initiatives-SWAP-WX				
PHX		+15	1636	VOL Multi-taxi				
TEB		+75	2004	TM Initiatives-SWAP-WX				

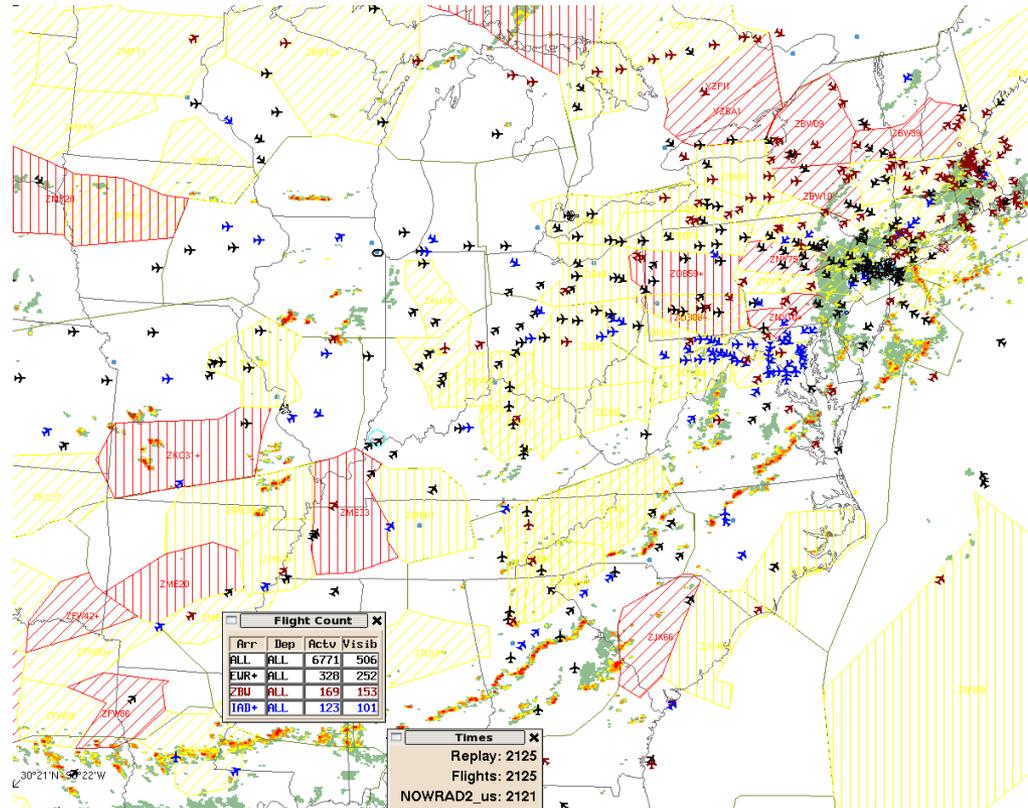
# Airline Operations / ANSP Service Delivery



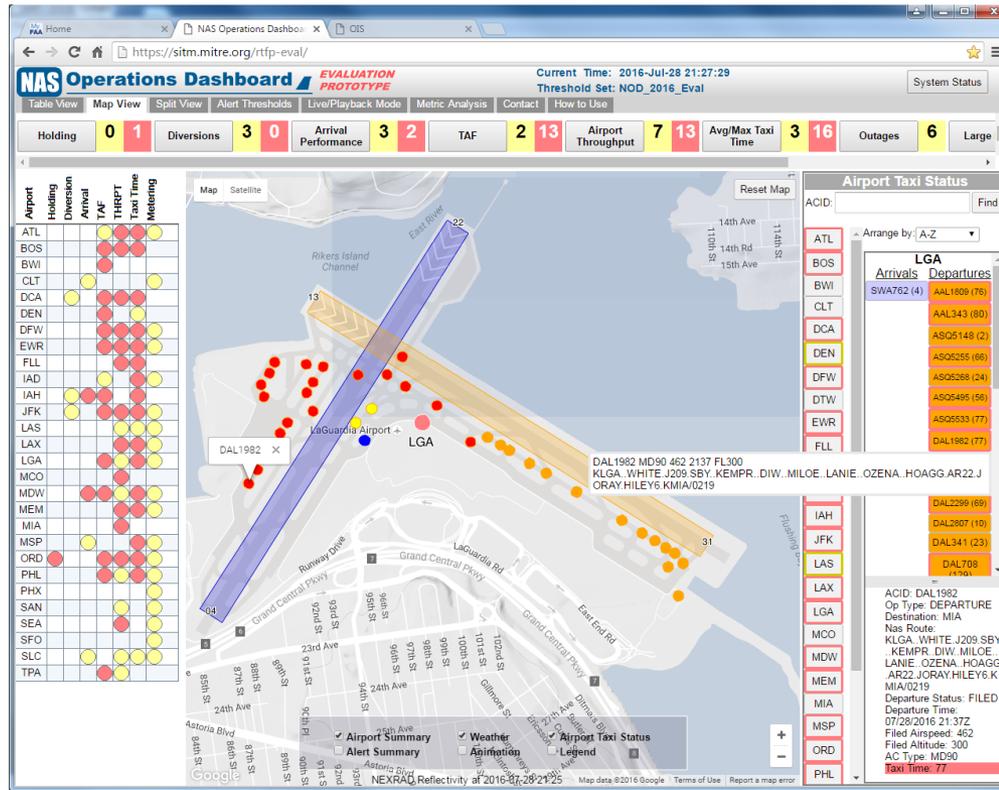
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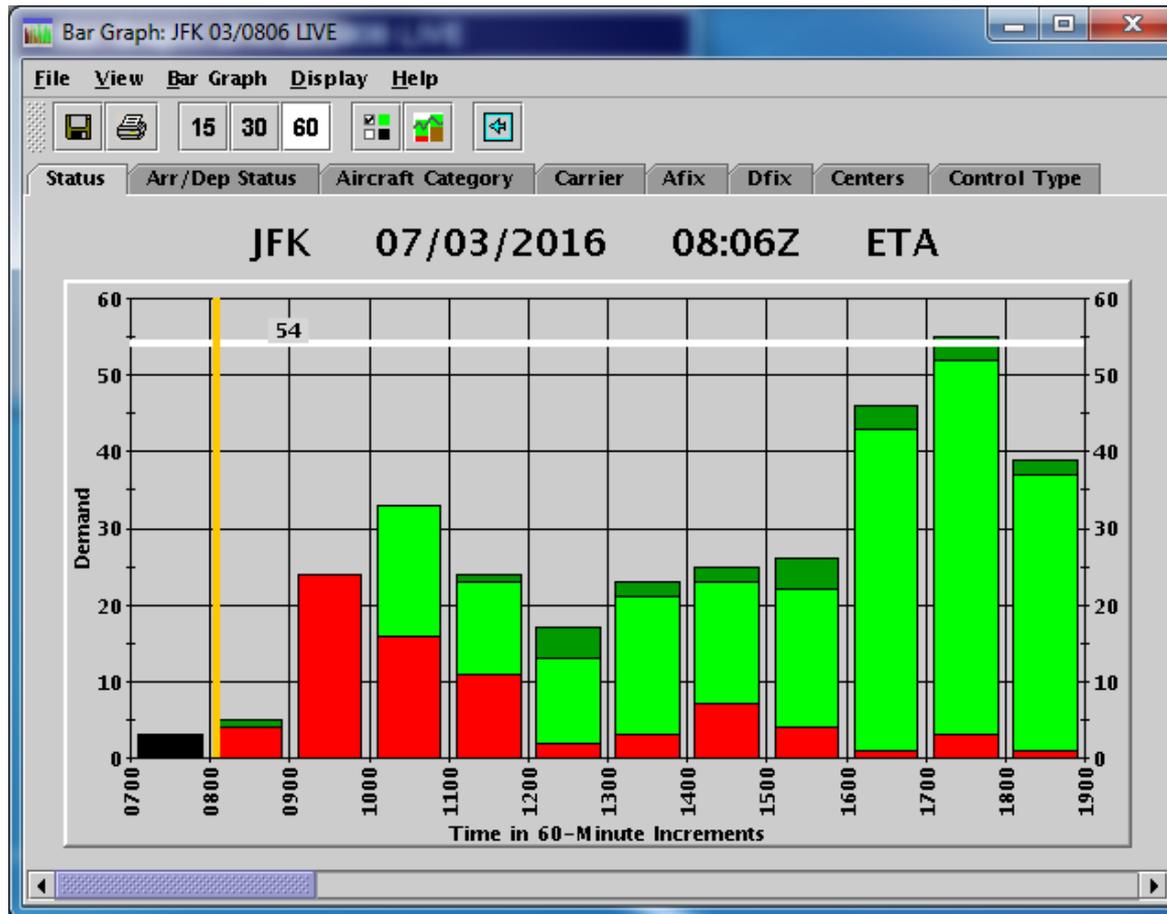
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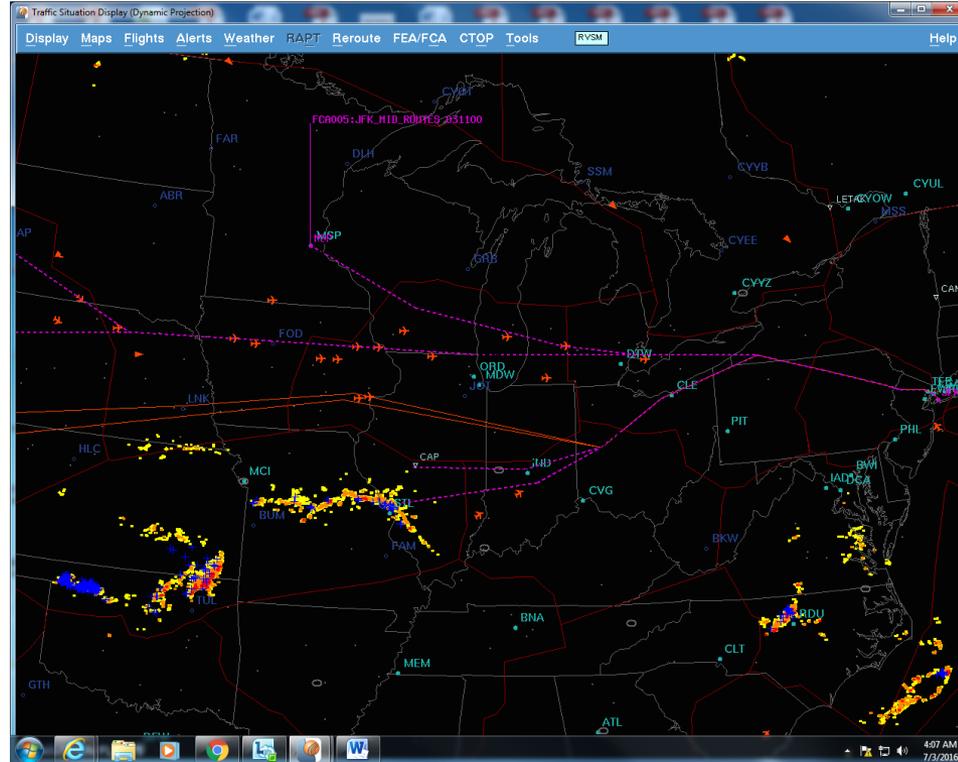
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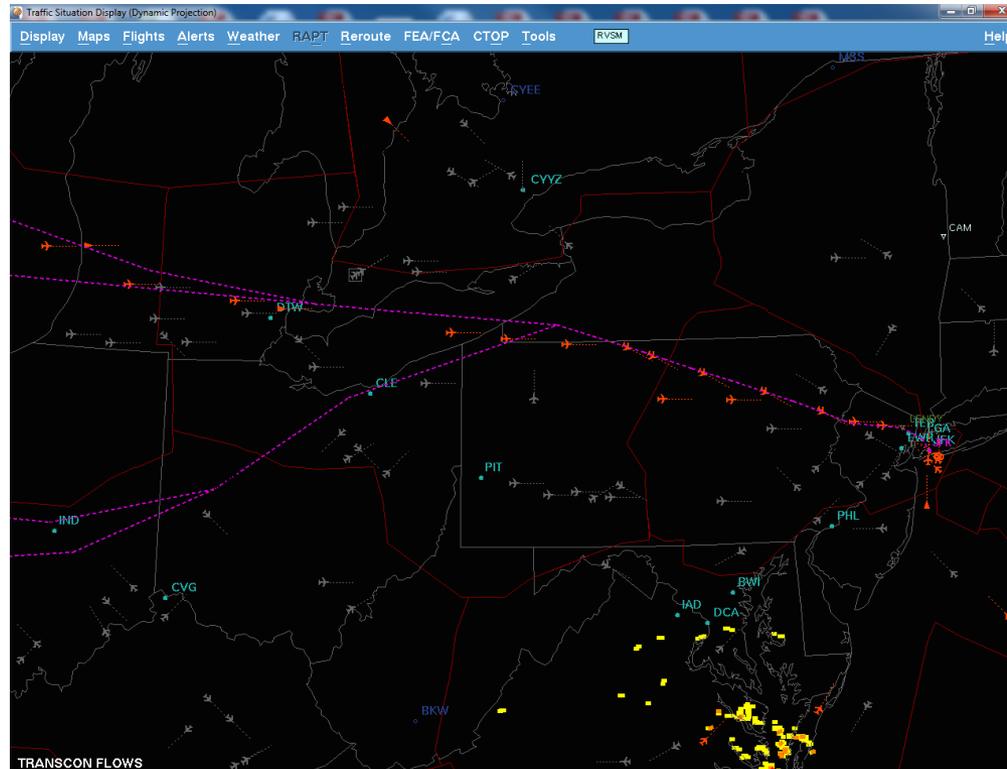
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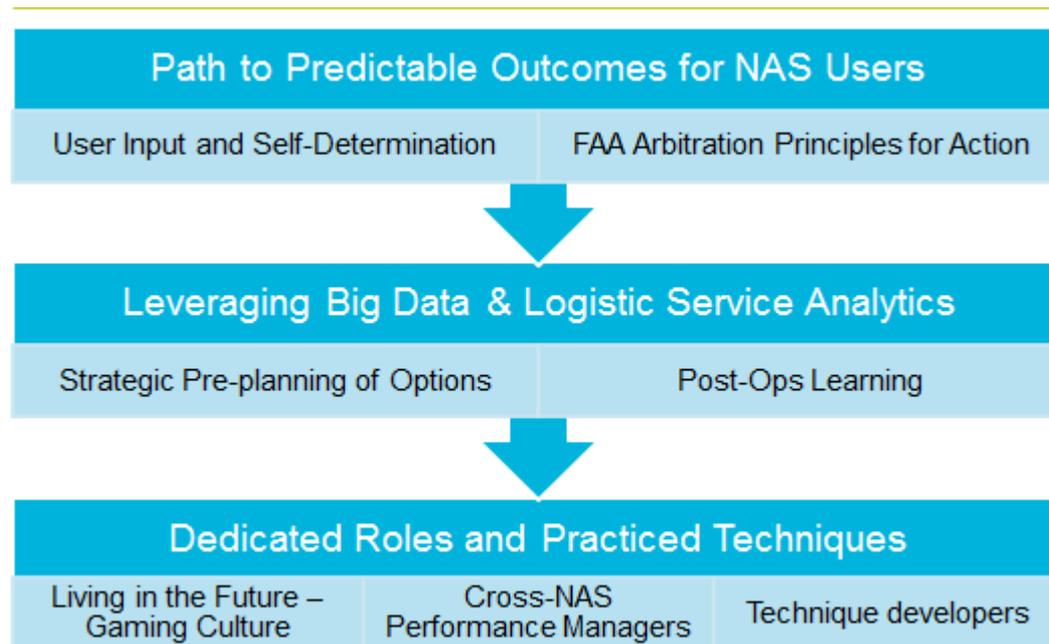
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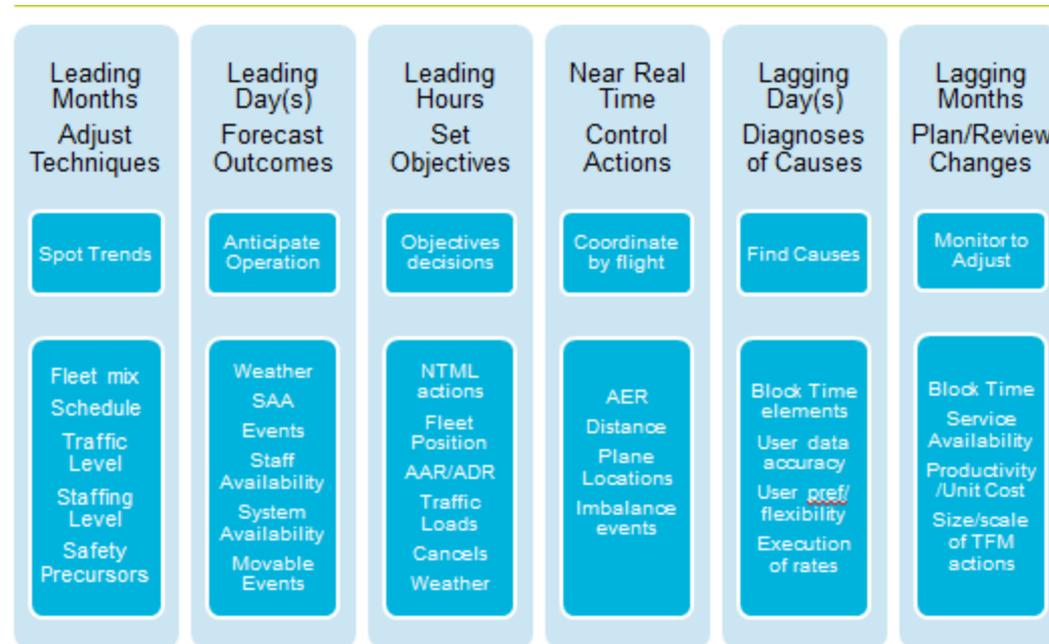
# Organizational Process Strategy



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# Questions?

